Space Weather Forecast

Issued on Monday, 23 January 2023 at 01:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: R1/R2 Radio Blackouts likely throughout. Chance of G1/Minor Geomagnetic Storms 23rd & 24th.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate during the past 24 hours, with two Moderate-class flares observed from the complex regions in the southwest. There are currently nine sunspot regions on the visible disc. Most sunspot regions continue to evolve slowly, with the two spots in the southwest most notable due to their magnetic complexity and size. Other sunspot regions are small, simple and appear to be relatively stable at this time.

Solar Wind / Geomagnetic Activity: Solar winds have been indicative of weak and waning coronal hole fast wind effects. Wind speeds were slightly elevated. The IMF has been weak, but on a slight increasing trend. The north-south component was also weak throughout, fluctuating between weakly positive/negative. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with a slight chance of reaching High levels. There are numerous candidate regions on the disc for significant flares, however, the most capable regions at this time are the two complex regions in the southwest.

Solar Wind / Geomagnetic Activity: Solar wind speeds expected to ease initially as we exit the fast wind of coronal hole 68. Enhancements are considered likely during 23rd and 24th due to a number of possible coronal mass ejection arrivals and later the arrival of the fast wind from coronal hole 69, perhaps with Elevated or Strong solar wind speeds at times. Generally Quiet geomagnetic activity is expected initially, with a chance of Active to G1/Minor storm intervals later day 1 and into day 2 (23rd and 24th) due to potential coronal mass ejection arrivals and later the fast wind coronal hole 69. These effects should start to start to wane day 3 and into day 4 (25th & 25th), though with lower than average confidence.

Energetic Particles / Solar Radiation: Solar radiation will most likely remain at background levels, but with a slight chance of enhancements to S1 or greater through the period, in association with any larger flares.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	50	40	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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